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L Number	Hits	Search Text	DB	Time stamp
3	23	extract\$4 near morphine	USPAT; EPO; JPO; DERWENT	2001/11/01 15:28
4	5	(extract\$4 near morphine) same opium	USPAT; EPO; JPO; DERWENT	2001/11/01 15:30
5	2	((extract\$4 near morphine) same opium) and (column or chromatog\$6)	USPAT; EPO; JPO; DERWENT	2001/11/01 15:30

19	9414	alkaloid	DERWENT USPAT; EPO; JPO; DERWENT	2001/11/01 12:50
20	1885	alkaloid same (extract\$ or isolat\$4 or purif\$6)	USPAT; EPO; JPO; DERWENT	2001/11/01 12:51
21	309	(alkaloid same (extract\$ or isolat\$4 or purif\$6)) same (column or chromatog\$6)	USPAT; EPO; JPO; DERWENT	2001/11/01 12:52
22	0	((alkaloid same (extract\$ or isolat\$4 or purif\$6)) same (column or chromatog\$6)) same (vat or static or dynamic)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:00
23	9	((alkaloid same (extract\$ or isolat\$4 or purif\$6)) same (column or chromatog\$6)) and (vat or static or dynamic)	USPAT; EPO; JPO; DERWENT	2001/11/01 12:57

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c:\apps\east\bin\default.wsp

24	9891	isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid	USPAT; EPO; JPO; DERWENT	2001/11/01 12:59
25	753	(isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:09
26	2	((isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)) same (vat or static or dynamic)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:00
27	86	((isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)) same (column or chromatog\$5)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:25
28	23	extract\$4 near morphine	USPAT; EPO; JPO; DERWENT	2001/11/01 13:26
29	2	(extract\$4 near morphine) same (plant or herb)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:26

24	9891	isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid	USPAT; EPO; JPO; DERWENT	2001/11/01 12:59
25	753	(isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:09
26	2	((isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)) same (vat or static or dynamic)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:00
27	86	((isoquinoline adj alkaloid or codeine or curare or heroin or morphine or papaverine or tubocurarine or benzylisoquinoline adj alkaloid) same (purif\$7 or extract\$4 or isolat\$4)) same (column or chromatog\$5)	USPAT; EPO; JPO; DERWENT	2001/11/01 13:10

DERWENT-ACC-NO: 1966-12630F  
DERWENT-WEEK: 196800  
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TITLE: Extraction of opium alkaloids from poppy plants

PATENT-ASSIGNEE: LOFFLER H[LOFF]

PRIORITY-DATA: 1958DD-0058082 (November 27, 1958)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DD 28733 A		N/A	000	N/A

ABSTRACTED-PUB-NO: DD 28733A

BASIC-ABSTRACT: An improved process for the extraction of morphine, narcotine, codeine, thebaine and papaverine from poppy plants.

The plant material is extracted in the presence of alkaline salts e.g. alkali carbonates, or weak acid reacting salts e.g. CaCl<sub>2</sub>, with a lower aliphatic alcohol containing 10-50% water according to the condition of the material to be extracted. The extract, adjusted if necessary to 10-60% alcohol by addition of water or distillation of alcohol, is extracted at pH 9-11 with tri- or tetra-chloro ethylene, whereby a separation of the morphine from other alkaloids is effected, the morphine remaining in the alcohol layer. The chlorinated hydrocarbon layer is evaporated in vacuo and the residue extracted with acid and the other alkaloids isolated in known manner.

TITLE-TERMS:

EXTRACT OPIUM POPPY PLANT

DERWENT-CLASS: B00

CPI-CODES: B04-A04;

CHEMICAL-CODES:

Chemical Indexing M0 \*01\*

Fragmentation Code

V440 V441 D111 D112 D631 E530 E550 G100 M531 H181

H201 H401 H441 H461 J521 H541 H543 H561 H563 N160

M412 M900

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**isoquinoline alkaloid (chem. compound)**

- [see benzyloisoquinoline alkaloid](#)
- [see codeine](#)
- [see curare](#)
- [see heroin](#)
- [see morphine](#)
- [see papaverine](#)
- [see tubocurarine](#)

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## ARTICLE

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# alkaloid

any of a class of naturally occurring organic nitrogen-containing bases.

**Alkaloids** have diverse and important physiological effects on humans and other animals. Well-known **alkaloids** include morphine, strychnine, quinine, ephedrine, and nicotine.

**Alkaloids** are found primarily in plants and are especially common in certain families of flowering plants. More than 3,000 different types of **alkaloids** have been identified in a total of more than 4,000 plant species. In general, a given species contains only a few kinds of **alkaloids**, though both the opium poppy (*Papaver somniferum*) and the ergot fungus (*Claviceps*) each contain about 30 different types. Certain plant families are particularly rich in **alkaloids**; all plants of the poppy family (Papaveraceae) are thought to contain them, for example. The Ranunculaceae (buttercups), Solanaceae (nightshades), and Amaryllidaceae (amaryllis) are other prominent **alkaloid**-containing families. A few **alkaloids** have been found in animal species, such as the New World beaver (*Castor canadensis*) and poison-dart frogs (*Phyllobates*). Ergot and a few other fungi also produce them.

The function of **alkaloids** in plants is not yet understood. It has been suggested that they are simply waste products of plants' metabolic processes, but evidence suggests that they may serve specific biological functions. In some plants, the concentration of **alkaloids** increases just prior to seed formation and then drops off

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prior to seed formation and then drops off when the seed is ripe, suggesting that **alkaloids** may play a role in this process. **Alkaloids** may also protect some plants from destruction by certain insect species.

The chemical structures of **alkaloids** are extremely variable. Generally, an **alkaloid** contains at least one nitrogen atom in an amine-type structure--*i.e.*, one derived from ammonia by replacing hydrogen atoms with hydrogen-carbon groups called hydrocarbons. This or another nitrogen atom can be active as a base in acid-base reactions. The name **alkaloid** ("alkali-like") was originally applied to the substances because, like the inorganic alkalis, they react with acids to form salts. Most **alkaloids** have one or more of their nitrogen atoms as part of a ring of atoms, frequently called a cyclic system. **Alkaloid** names generally end in the suffix *-ine*, a reference to their chemical classification as amines. In their pure form most **alkaloids** are colourless, nonvolatile, crystalline solids. They also tend to have a bitter taste.

Interest in the **alkaloids** stems from the wide variety of physiological effects (both wanted and unwanted) they produce in humans and other animals. Their use dates back to ancient civilizations, but scientific study of the chemicals had to await the growth of organic chemistry, for not until simple organic bases were understood could the intricate structure of the **alkaloids** be unraveled. The first **alkaloid** to be isolated and crystallized was the potent active constituent of the opium poppy, morphine, in 1805-06.

**Alkaloids** are often classified on the basis of their chemical structure. For example, those **alkaloids** that contain a ring system called indole are known as indole alkaloids. On this basis, the principal classes of **alkaloids** are the pyrrolidines, pyridines, tropanes, pyrrolizidines, **isoquinolines**, indoles, quinolines, and the

alkaloids  
Rauwolfia  
alkaloid  
rutaecarpine  
scopolamine  
skytanthine  
slaframine  
solanine  
steroid alkaloid  
taxine  
terpenoid alkaloid  
tropane alkaloid  
vinblastine  
vincristine  
yohimbine

terpenoids and steroids. Alternatively, **alkaloids** can be classified according to the biological system in which they occur. For example, the opium **alkaloids** occur in the opium poppy (*Papaver somniferum*). This dual classification system actually produces little confusion because there is a rough correlation between the chemical types of **alkaloids** and their biological distribution.

The medicinal properties of **alkaloids** are quite diverse. Morphine is a powerful narcotic used for the relief of pain, though its addictive properties limit its usefulness. Codeine, the methyl ether derivative of morphine found in the opium poppy, is an excellent analgesic that is relatively nonaddictive. Certain **alkaloids** act as cardiac or respiratory stimulants. Quinidine, which is obtained from plants of the genus *Cinchona*, is used to treat arrhythmias, or irregular rhythms of the heartbeat. Many **alkaloids** affect respiration, but in a complicated manner such that severe respiratory depression may follow stimulation. The drug lobeline (from *Lobelia inflata*) is safer in this respect and is therefore clinically useful. Ergonovine (from the fungus *Claviceps purpurea*) and ephedrine (from *Ephedra* species) act as blood-vessel constrictors. Ergonovine is used to reduce uterine hemorrhage after childbirth, and ephedrine is used to relieve the discomfort of common colds, sinusitis, hay fever, and bronchial asthma.

Many **alkaloids** possess local anesthetic properties, though clinically they are seldom used for this purpose. Cocaine (from *Erythroxylon coca*) is a very potent local anesthetic. Quinine (from *Cinchona* species) is a powerful antimalarial agent that was formerly the drug of choice for treating that disease, though it has been largely replaced by less toxic and more effective synthetic drugs. The **alkaloid** tubocurarine is the active ingredient in the South American arrow poison, curare





(obtained from *Chondrodendron tomentosum*), and is used as a muscle relaxant in surgery. Two **alkaloids**, vincristine and vinblastine (from *Vinca rosea*), are widely used as chemotherapeutic agents in the treatment of many types of cancer.

Nicotine obtained from the tobacco plant (*Nicotiana tabacum*) is the principal **alkaloid** and chief addictive ingredient of the tobacco smoked in cigarettes, cigars, and pipes. Some **alkaloids** are illicit drugs and poisons. These include the hallucinogenic drugs mescaline (from *Anhalonium* species) and psilocybin (from *Psilocybe mexicana*). Synthetic derivatives of the **alkaloids** morphine and lysergic acid (from *C. purpurea*) produce heroin and LSD, respectively. The **alkaloid** coniine is the active component of the poison hemlock (*Conium maculatum*). Strychnine (from *Strychnos* species) is another powerful poison.

Special methods have been developed for isolating commercially useful **alkaloids**. In most cases, plant tissue is processed to obtain aqueous solutions of the **alkaloids**. The **alkaloids** are then recovered from the solution by a process called extraction, which involves dissolving some components of the mixture with reagents. Different **alkaloids** must then be separated and purified from the mixture. Chromatography may be used to take advantage of the different degrees of adsorption of the various **alkaloids** on solid material such as alumina or silica. **Alkaloids** in crystalline form may be obtained using certain solvents. (See analgesic.)

#### INTERNET LINKS

Search for related Internet links that use the term "alkaloid".

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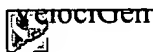
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